

BEFORE THE  
POSTAL REGULATORY COMMISSION  
WASHINGTON, D.C. 20268-0001

Inquiry Concerning City Carrier Costs

Docket No. PI2017-1

RESPONSES OF THE UNITED STATES POSTAL SERVICE TO  
QUESTIONS 1-15 OF CHAIRMAN'S INFORMATION REQUEST NO. 5

The United States Postal Service hereby provides its responses to the above-listed questions of Chairman's Information Request No. 5, issued on March 2, 2018. Each question is stated verbatim and followed by the response.

Respectfully submitted,

UNITED STATES POSTAL SERVICE

By its attorney:

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**RESPONSES OF THE UNITED STATES POSTAL SERVICE  
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1. In its Response to CHIR No. 4, the Postal Service states that the Time and Attendance Collection System (TACS) "is the repository for workhours clocked in by City carriers, clerks and supervisors" and that the Sunday Delivery Reporting website summarizes these data for Sundays and Holidays. Response to CHIR No. 4, question 2. The following questions pertain to two sources of Sunday workhour data, Docket No. RM2017-9<sup>1</sup> and Docket No. ACR2016.<sup>2</sup>
  - a. Please explain the reasons for differences between the FY 2016 city carrier special purpose route (SPR) Sunday TACS workhours contained in Docket No. RM2017-9 and the Sunday city carrier workhours contained in Docket No. ACR2016.
  - b. Please explain the reasons for differences between the FY 2016 city carrier supervisor Sunday TACS workhours contained in Docket No. RM2017-9 and the Sunday supervisor hours contained in Docket No. ACR2016.
  - c. Please describe the city carrier clocking practices and activities for workhours clocked to Labor Distribution Code (LDC) 23 -- "OTHER CITY DELIVERY" and LDC 27 -- "COLLECTIONS." In the response, please also explain:
    - i. how clocking practices and activities for LDCs 23 and 27 differ from, or are similar to, clocking practices and activities for workhours clocked to LDC 24 -- "DELIVERY INITIATIVES;" and
    - ii. the reason(s) for the large increase in LDC 24 workhours and the large decrease in LDC 23 hours between FY 2016 and FY 2017.<sup>3</sup>

**RESPONSE:**

- a. The Sunday TACS workhours in Docket No. RM2017-9 include all city carrier workhours at all locations and for all weeks in FY2016. The city carrier workhours contained in Docket No. ACR2016 are limited to the TACS workhours at locations associated with Domestic Competitive NSAs, and do

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<sup>1</sup> Docket No. RM2017-9, Library Reference USPS-RM2017-9/1, folder "Input\_Files," quarterly text files "TACSCAG...", August 9, 2017.

<sup>2</sup> Docket No. ACR2016, Library Reference USPS-FY16-NP27, folder "Ground," December 29, 2017.

<sup>3</sup> See Docket No. ACR2017, Responses of the United States Postal Service to Questions 1-19 of Chairman's Information Request No. 2, question 3, Excel file "ChIR.2.Q.3.LDC.Workhours – FY17.xlsx," tab "3 National Workhour Report," rows 47 and 48, columns D and E, January 17, 2018.

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not include certain weeks, such as peak season, as noted in the original filing.<sup>4</sup>

- b. The Sunday TACS workhours in Docket No. RM2017-9 include all supervisor workhours at all locations and for all weeks in FY2016. The supervisor workhours contained in Docket No. ACR2016 are limited to the TACS workhours at locations associated with Domestic Competitive NSAs, and do not include certain weeks, such as peak season, as noted in the original filing.
- c.
  - i. Carriers use the same clocking practices for LDC 23, LDC 24, and LDC 27. In all instances, carriers use time cards to clock into an operation, not an LDC. The operation-specific clock rings are accumulated by labor distribution code according to the mapping between operations and LDCs. LDC 24 was re-introduced in the MODS clocking system in February 2017, resulting in the changes described.
  - ii. LDC 24 was reactivated for use in February 2017. This change resulted in the shift of hours that is seen from FY2016 to FY2017.

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<sup>4</sup> See Docket No. ACR2016, Library Reference USPS-FY16-NP27, folder "Ground," "Sunday\_Delivery\_Cost\_FY16.xlsx", sheet SundayHolidayDelivery, note 1.

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2. In Docket No. RM2017-9, the Postal Service provided a table mapping its operation numbers to LDCs 23 and 24.<sup>5</sup> The table shows that four operation numbers map to LDC 24. Two are labeled as Sunday-specific operation numbers: "Sunday Parcel – Street" and "Sunday Parcel – Office," while two others are not ("Customized Delivery – Street" and "Customized Delivery – Office"). *Id.* Please discuss whether workhours from these latter two operation numbers will be included in the Postal Service's updated SPR cost model.<sup>6</sup>

**RESPONSE:**

No decision has been made about the treatment of operation numbers related to Customized Delivery, but their magnitude is quite small, which may affect how they are treated. One possibility would be to combine them with LDC 23 hours in a single cost pool.

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<sup>5</sup> Docket No. RM2017-9, Responses of the United States Postal Service to Questions 1-15, 19-20, and 23 of Chairman's Information Request No. 1, August 9, 2017, question 1.

<sup>6</sup> The Postal Service identified two LDCs workhours for updating the SPR cost model. Response to CHIR No. 4, question 6.

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3. In its Response to CHIR No. 1, the Postal Service states that it eliminated volumes delivered on Sundays and holidays from its dataset "because letter routes do not operate on those days." Response to CHIR No. 1, question 1.
- a. Please confirm that the In-Office Cost System (IOCS) allocates some costs associated with city carrier Sunday readings to the letter route cost pool and to "Route 99-Training Route," rather than to the SPR cost pool.<sup>7</sup> If confirmed, please discuss the IOCS methodology for these costs, in light of the above-referenced statement that "letter routes do not operate on those days."
  - b. In Docket No. RM2017-9, Sunday-clocked city carrier training (LDC 92) and letter route (LDCs 21, 22, 26, 28, 29) workhours were grouped with the non-Sunday letter route workhours to develop the TACS-adjusted IOCS-estimated city carrier letter route cost pool.<sup>8</sup> Please explain the reason(s) for grouping these Sunday-clocked city carrier workhours with the non-Sunday letter route workhours, in light of the above-referenced statement that "letter routes do not operate on those days."

**RESPONSE:**

- a. Confirmed. IOCS assigns activity codes for Sunday readings the same way as on other days of the week. While the vast majority of IOCS readings taken on Sunday are mapped to SPR routes, some were mapped to the letter route cost pool and to "Route 00 – training". Of the Sunday tally costs assigned to the letter route and "Route 99- Training Route" cost pool, further investigation has revealed that a number were mapped incorrectly.

One situation occurs when city carrier assistants are acting as supervisors, therefore not working a particular route at the time of the reading.

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<sup>7</sup> See Docket No. ACR2017, Library Reference USPS-FY17-37, folder "Data," SAS file "prcpub17.sas7bdat," December 29, 2017.

<sup>8</sup> Commission analysis of Docket No. RM2017-9, Library Reference USPS-RM2017-9/1, folder "Input\_Files," quarterly text files "TACSCAG...", and folder "SASPrograms," program "ALB104."

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These tallies are recorded as “unknown route” (route type 99), which by default is assigned to the letter route group. Similarly, carriers receiving training do not have an assigned route, and these tallies are also mapped into the letter route group by default. Another reason is that, in some locations, the last two digits of a Sunday parcel route has a local route number that happens to coincide with regular delivery routes. This can lead to the tally to be mapped incorrectly to letter routes. These situations can be corrected with Sunday-specific rules for recoding of tallies. The situation would also be ameliorated by the development of a separate costpool for Sundays/Holidays.

- b. The main reason Sunday-clocked city carrier training and letter route workhours were grouped with the non-Sunday letter route workhours was to incorporate official TACS data in the TACS-adjusted IOCS-estimate with a minimum of changes from the existing methodology. Although the policy on Sundays is that “letter routes do not operate on those days,” in practice some carriers are clocking to letter routes, most likely by mistake or convenience. To avoid additional complexity in modifying assignment of tallies and workhours, the underlying clock rings were left unchanged, but the Postal Service agrees that Sunday workhours should not be associated with weekday letter routes. In approving Docket No. RM2017-9, the Commission instructed that these erroneously clocked letter route Sunday workhours be shifted to SPR workhours. The Postal Service suggests that the creation of a separate costpool for Sundays/Holidays would be a further improvement.

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4. In November of 2017, the Postal Service stated that it had “been making progress” in estimating single-equation, top-down equations for LDCs 23 and 27. Response to CHIR No. 4, question 6. At that time, the Postal Service stated that “accomplishing these tasks [would] require approximately six months” if “no snags [were] encountered throughout the research process.” *Id.* Please provide an up-to-date progress report on this research, including any recent findings and any schedule updates.

**RESPONSE:**

Specifically the response stated that:

Once the data set is constructed, estimation of relevant variability equations can begin. Equation estimation requires, among other tasks, choice of variables to be included in the model, choice of a functional form, choice of a level of analysis, choice of an estimation technique, evaluation of the econometric properties of the estimated equations, and evaluation of the results. Assuming that no snags are encountered throughout the research process, the Postal Service estimates that accomplishing these tasks will require approximately six months.

The Postal Service is nearing completion of an initial data set, so the subsequent tasks listed in the response should commence in the near future. Consistent with that response, the Postal Service anticipates that, assuming no snags are encountered, the subsequent tasks should require approximately six months.

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5. In its Response to CHIR No. 4, the Postal Service states that "SPR carriers who collect mail clock to LDC 27 primarily, though not exclusively, and some collection occurs while clocked to LDC 23." Response to CHIR No. 4, question 11. Please describe under what circumstances and for what activities SPR carriers who collect mail clock to LDC 23 and under what circumstances and for what activities carriers who collect mail clock to LDC 27. In the response, please also distinguish the clocking procedures for collection mail captured from: (1) customer receptacles, (2) collection points, and (3) containerized mail from businesses.<sup>9</sup>

**RESPONSE:**

SPR carriers clock into operations, not specific activities. Thus, for example, a carrier who clocks into operation 731, which is a street collection operation included in LDC 27, may deliver a package after leaving the office, but before beginning to sweep (collect mail from) collection boxes. Conversely, a carrier who clocks into operation 733, which is a street parcel delivery operation included in LDC 23, could sweep a collection box after finishing parcel deliveries, but before returning to the office.

Clocking procedures are the same regardless of the type of collection activity the carrier undertakes -- carriers use time cards to clock into an operation which describes the predominant activity in which the carrier will engage. Thus, the clocking procedures are the same for collection mail captured from: (1) customer receptacles, (2) collection points, and (3) containerized mail from businesses. However, SPR carriers primarily collect mail from collection points

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<sup>9</sup> Response to CHIR No. 4, question 7 states that "collection mail was captured separately from three sources 1) customer receptacles, 2) collection points, and 3) containerized mail from businesses."



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and from businesses, and rarely collect mail from customer receptacles. For example, if collection of mail from collection points would be the predominant activity for the carrier, then he or she would clock into operation 731.

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6. In Docket No. RM2015-7, the Postal Service stated that "TACS can be used to form separate cost pools for LDC 23 and LDC 27, but these operational data do not provide any further detail on the times required to perform the different specific activities performed by city SPR carriers." Response to Order No. 2792 at 17. The Postal Service also stated that it could use TACS data to estimate "single-equation, 'top-down' equations for each of the two LDCs." *Id.*
- a. Please confirm whether the Postal Service uses the Enterprise Analytics Dynamic Routing Tool (EA-DRT) for non-Sunday city carrier SPR deliveries clocked to LDC 23.<sup>10</sup>
  - b. If confirmed, please discuss whether SPR street time proportions for LDC 23, such as drive, stop, and travel time, could be developed or updated. If they cannot, please discuss the reasons why not.
  - c. Please discuss how the Postal Service intends to use the workhours of the carriers who collect mail and clock to both LDC 23 and LDC 27 to create two distinct cost pools and top-down equations.

**RESPONSE:**

- a. Not confirmed. Except for the December peak period, dynamic routing is only used in isolated instances for SPR deliveries.
- b. Not applicable.
- c. The Postal Service has not finalized how cost pools will be formed for estimating variability equations for SPR costs, so a definitive answer cannot be provided. Generally, the estimation of a top-down equation implies creating a general cost pool that includes the various activities performed by carriers. For example, in letter-route delivery, the top-down

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<sup>10</sup> The Postal Service states that this EA-DRT "uses a routing algorithm to develop routes to be used for delivering the Sunday and Holiday pieces and calculates route miles." Response to CHIR No. 4, question 2. The EA-DRT analyzes various addresses, works with the Address Management System and "orders them into a route that has the minimum number of miles and for which the carrier will need minimum time to deliver packages." See United States Postal Service Office of Inspector General *Readiness for Package Growth-Delivery Operations*, Management Advisory Report, Report Number DR-MA-14-001, December 11, 2013, at 4.

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model includes all DOIS hours covering all of the various activities a letter carrier does on his or her route. By analogy, a top-down equation for SPR carriers would include hours for all of the various activities performed by SPR carriers.

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7. In its Response to CHIR No. 4, the Postal Service states that “the draft procedures for capturing collection volume have the potential to provide meaningful information that could be used to develop a carrier street time model. However, the material cost of capturing this information is a legitimate concern that could impede or prevent its implementation.”<sup>11</sup> Please discuss whether the Postal Service has attempted to extrapolate a sample of delivery days’ collection volumes or apply weights to those volumes in order to estimate daily volume data at a reduced cost. If the Postal Service has not evaluated this possibility, please explain why not and discuss whether this approach is feasible.

### RESPONSE:

It has not. In discussing UPS’s efforts to extrapolate volumes in order to estimate a top-down model based upon Form 3999 data, the Commission expressed concerns about the implications for the reliability of the final model:

The Commission finds the need to impute volume data that are not otherwise available substantially undermines the reliability of the National Form 3999 model. Present data shortcomings cause the model to have high multicollinearity and a high probability of biased estimates.<sup>12</sup>

To accurately impute or extrapolate accurate collection volumes for thousands of individual route days based upon data collected for a small sample of those routes appears to be a challenging task and could likely fall victim to the same shortcomings the Commission pointed out about previous efforts at imputation.

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<sup>11</sup> Response to CHIR No. 4, question 7. The Postal Service states that “[u]sing an estimate of four minutes of carrier time per route day and the FY 2016 City Carrier average wage rate of \$40.90, the estimated direct cost per route day is \$2.73. Adding indirect costs increases the daily cost to \$3.63. Extrapolating this cost to 140,000 city letter routes results in a daily cost estimate of nearly \$508,000.” *Id.*

<sup>12</sup> Order No. 2792, Order Approving Analytical Principles Used In Periodic Reporting (Proposal Thirteen), October 29, 2015, at 61.

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8. Based on the number of routes sampled in the City Carrier Cost System (CCCS), please estimate the percentage (or number) of the FY 2017 city carrier routes (or route-days) that have collection volumes. In the response, please estimate the percentage of those city carrier routes or city carrier route-days with collection volume that have daily collection volumes.

**RESPONSE:**

The collection mail portion of the City Carrier Cost System (CCCS) is designed to provide a distribution key for any mail that a city letter route carrier returns to the office. Although about 9 percent of FY 2017 city letter routes sampled in the City Carrier Cost System (CCCS) were recorded as having zero collection volume, an unknown number of those routes could have collection volumes not recorded because of route pivoting, or because of the carrier dropping collection mail into collection (blue) boxes before returning from the route. Additionally, of the 91 percent of CCCS tests in FY 2017 that recorded volumes on the PS Form 2846, it is possible that an unknown percentage of those routes actually had no collection volume, but had other mail returned from the route that was correctly recorded on the PS Form 2846.

CCCS does not sample individual routes on multiple days of the week, so it cannot be used to estimate the percentage of routes that have daily collection mail volumes.

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9. The Postal Service estimates the daily cost of using Mobile Delivery Devices (MDDs) to measure the collection volumes of 140,000 city letter routes at nearly \$508,000. Response to CHIR No. 4, question 7. The Postal Service has found that a small number of delivery points on business and mixed routes generate the highest collection volumes.<sup>13</sup>
- a. Please provide the total number of FY 2017 city carrier business routes (excluding business foot routes).<sup>14</sup> Please indicate what proportion of the total city carrier routes this number represents.<sup>15</sup>
  - b. Please provide the FY 2017 total number of city carrier mixed routes (excluding mixed foot routes).<sup>16</sup> Please indicate what proportion of the total city carrier routes this number represents.<sup>17</sup>

**RESPONSE:**

- a. The total number of city carrier business routes (excluding business foot routes) was 1,537 from the CCCS frame used for FY2017 Q1, which is 1 percent of the total city carrier routes. Other quarters were similar.
- b. The total number of city carrier mixed routes (excluding mixed foot routes) was 8,007 from the CCCS frame used for FY2017 Q1, which is 6 percent of the total city carrier routes. Other quarters were similar.

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<sup>13</sup> See Docket No. RM2015-7, Library Reference USPS-RM2015-7/1, folder "Letter\_Route\_Report," PDF file "City Carrier Street Time Study Report.pdf," December 11, 2014, at 38.

<sup>14</sup> High collection volumes were not on foot routes. *Id.*

<sup>15</sup> FY 2017 estimated business motorized routes city carrier street time cost is approximately 1 percent of total city carrier letter route street time cost. See Docket No. ACR2017, Library Reference USPS-FY17-32, Excel file "CS06&7-Public-FY17.xlsx," tab "Input IOCS," cell G11. The sum of row 11 in this same file and tab is the estimated total letter route street time cost.

<sup>16</sup> High collection volumes were not on foot routes. *Id.*

<sup>17</sup> FY 2017 estimated mixed curb and mixed residential routes combined city carrier street time cost is approximately 5.9 percent of the total city carrier letter route street time cost. See Docket No. ACR2017, Library Reference USPS-FY17-32, Excel file "CS06&7-Public-FY17.xlsx," tab "Input IOCS," cells L11, M11. The sum of row 11 in this file and tab is the estimated total letter route street time cost.

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- 10.** The Postal Service states that MDDs would capture parcel collection volume “through data obtained by Package Pickup, rather than the carrier entering separate piece counts for collected parcels, as was done during the [City Carrier Collection Mail Volume and Source Study] CCCMVSS.” Response to CHIR No. 4, question 7.
- a. Please confirm that in the CCCS, “Carrier Pickup” and “Package Pickup” parcel collection volumes are the same quantity.<sup>18</sup> If not confirmed, please explain.
  - b. Please specify the data source(s) and methodology for obtaining parcel collection volumes via “Package Pickup.” Please include all applicable documentation with the response.
  - c. The CCCS estimates that the FY 2017 approximate total collection volumes are 73.8 million for “Carrier Pickup,” 174.1 million for “Customer Outgoing Parcels,” and 14.7 million for “Blue Box Parcels.”<sup>19</sup> Please provide the FY 2017 collection volumes for “Package Pickup” and explain any differences from the CCCS estimated collection volumes listed.

**RESPONSE:**

- a. Confirmed.
- b. CCCS methodology and documentation can be found in USPS-FY2017-34.
- c. Given that part a. is confirmed, there is no difference.

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<sup>18</sup> See Docket No. ACR2017, Library Reference USPS-FY17-34, Excel file “FY2017\_Collection\_Final\_Public.xlsx,” column G, December 29, 2017.

<sup>19</sup> See Docket No. ACR2017, Library Reference USPS-FY17-34, Excel file “FY2017\_Collection\_Final\_Public.xlsx,” columns D, F, G, “Customer Outgoing Parcels,” “Blue Box Parcels,” and “Carrier Pickup,” respectively, December 29, 2017.

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11. In Library Reference USPS-PI2017-1/3, file "ACTIVE\_ROUTE.html," there are the following types of delivery routes: city route, rural route, box route, highway contract route, and general delivery route.<sup>20</sup> Please describe how these route types are distinguished from each other.

**RESPONSE:**

Generally, route types are best distinguished by the type of employee or contractor servicing the route. City Carriers service city routes, Rural Carriers service rural routes, and highway contract routes are serviced by postal contractors. Box routes refer to the delivery performed at Post Office Boxes, and are typically serviced by clerks as opposed to carriers. General Delivery routes are also primarily serviced by clerks, as a means of temporary delivery for customers with no current permanent address. The City and Rural distinction can also be made based on the relation of the route to Post Office boundaries and city limits. However, it should be noted that with urban expansion, this is not necessarily always the case, as the type of route rarely changes after initial activation.

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<sup>20</sup> Library Reference USPS-PI2017-1/3, November 28, 2017.



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- 12.** Please provide an un-redacted version of the United States Postal Service Office of Inspector General, Package Delivery Scanning-Nationwide, Audit Report.<sup>21</sup>

**RESPONSE:**

The requested version is provided under seal in USPS-PI2017-1/NP1.

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<sup>21</sup> United States Postal Service Office of Inspector General, Package Delivery Scanning – Nationwide, Audit Report Number, DR-AR-18-001, October 27, 2017.

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13. In its Response to CHIR No. 4, the Postal Service states that it performed the Bruesch-Pagan test "for the full top-down model based upon both July and September data" and the results confirmed "the presence of heteroscedasticity." Response to CHIR No. 4, question 17.
- Please provide the SAS output for the performed Bruesch-Pagan test.
  - Please indicate whether the Postal Service tested the model for ZIP Code-specific heteroscedasticity using either the Bruesch-Pagan test or White test. If so, please provide the SAS output for the performed test(s). If not please explain why not.

### RESPONSE:

a.

The SAS System

The MODEL Procedure

Nonlinear OLS Summary of Residual Errors							
Equation	DF Model	DF Error	SSE	MSE	Root MSE	R-Square	Adj R-Sq
street_hours	59	13741	7007990	510	22.5833	0.9065	0.9061

  

Nonlinear OLS Parameter Estimates				
Parameter	Estimate	Approx Std Err	t Value	Approx Pr >  t
const	35.80612	1.6239	22.05	<.0001
d1	0.000401	0.000063	6.31	<.0001
d2	-4.82E-09	7.49E-10	-6.43	<.0001
d3	0.001866	0.000142	13.13	<.0001
d4	-3.91E-08	3.64E-09	-10.75	<.0001
d5	0.005773	0.000206	28.01	<.0001
d6	-1.06E-07	9.53E-09	-11.12	<.0001
d7	0.001439	0.0001	14.32	<.0001
d8	-1.88E-08	1.76E-09	-10.69	<.0001
d9	0.014619	0.0018	8.13	<.0001
d10	-6.92E-06	9.33E-07	-7.42	<.0001
d11	0.020126	0.00189	10.66	<.0001

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<b>d12</b>	-1.16E-06	1.30E-07	-8.99	<.0001
<b>d13</b>	0.023037	0.0251	0.92	0.3586
<b>d14</b>	0.000429	0.000058	7.42	<.0001
<b>d15</b>	0.00749	0.000172	43.63	<.0001
<b>d16</b>	-6.67E-08	8.78E-09	-7.6	<.0001
<b>a1</b>	1.77E-08	2.81E-09	6.29	<.0001
<b>a2</b>	-1.26E-09	2.53E-09	-0.5	0.6176
<b>a3</b>	-6.27E-09	4.04E-09	-1.55	0.1205
<b>a4</b>	9.69E-08	4.62E-08	2.1	0.036
<b>a5</b>	-1.70E-07	4.07E-08	-4.17	<.0001
<b>a6</b>	-7.61E-07	6.09E-07	-1.25	0.2117
<b>a7</b>	3.35E-08	4.42E-09	7.58	<.0001
<b>a8</b>	4.44E-10	4.46E-09	0.1	0.9207
<b>a9</b>	3.19E-08	1.06E-08	3.02	0.0025
<b>a10</b>	-5.28E-07	1.03E-07	-5.11	<.0001
<b>a11</b>	4.08E-07	8.76E-08	4.66	<.0001
<b>a12</b>	-5.33E-06	1.33E-06	-4.02	<.0001
<b>a13</b>	1.54E-08	9.52E-09	1.62	0.1058
<b>a14</b>	-9.96E-09	7.61E-09	-1.31	0.1906
<b>a15</b>	-2.93E-07	7.78E-08	-3.77	0.0002
<b>a16</b>	-1.08E-07	6.95E-08	-1.56	0.1199
<b>a17</b>	4.18E-06	1.27E-06	3.28	0.001
<b>a18</b>	5.35E-09	6.77E-09	0.79	0.4292
<b>a19</b>	-2.91E-07	1.62E-07	-1.8	0.0719
<b>a20</b>	1.31E-06	1.90E-07	6.93	<.0001
<b>a21</b>	-6.98E-06	2.22E-06	-3.14	0.0017
<b>a22</b>	-1.29E-07	1.44E-08	-8.94	<.0001
<b>a23</b>	-2.00E-06	1.43E-06	-1.4	0.162
<b>a24</b>	0.000055	0.000019	2.96	0.0031
<b>a25</b>	6.91E-07	1.19E-07	5.82	<.0001
<b>a26</b>	0.000042	0.000016	2.72	0.0066
<b>a27</b>	-6.48E-07	1.32E-07	-4.91	<.0001
<b>a28</b>	-5.97E-06	1.70E-06	-3.5	0.0005
<b>b1</b>	5.24364	7.4057	0.71	0.4789
<b>b2</b>	48.40602	12.7839	3.79	0.0002
<b>b3</b>	-0.03275	0.00484	-6.76	<.0001
<b>b4</b>	0.000024	5.58E-06	4.29	<.0001
<b>b5</b>	16.35522	2.5861	6.32	<.0001
<b>b6</b>	-27.7549	2.3954	-11.59	<.0001

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<b>b7</b>	0.252652	0.0303	8.33	<.0001
<b>b8</b>	0.000055	0.000291	0.19	0.8506
<b>b9</b>	-52.3491	3.5167	-14.89	<.0001
<b>b10</b>	-5.84417	4.6344	-1.26	0.2073
<b>b11</b>	-172.319	5.1908	-33.2	<.0001
<b>b12</b>	165.178	10.4258	15.84	<.0001
<b>b13</b>	-47.5949	3.5745	-13.32	<.0001
<b>b14</b>	-76.3303	4.2917	-17.79	<.0001

Number of Observations		Statistics for System	
<b>Used</b>	13800	<b>Objective</b>	507.8254
<b>Missing</b>	0	<b>Objective*N</b>	7007990

Heteroscedasticity Test					
Equation	Test	Statistic	DF	Pr > ChiSq	Variables
<b>street_hours</b>	White's Test	9250	1.00E+03	<.0001	Cross of all vars
	Breusch-Pagan	1155	6	<.0001	1, dps, cm, seq, par, acct, pd

b. It did not, because such a test was not necessary. As explained in the response to Question 17 in CHIR No. 4 (November 28, 2017), to correct for heteroscedasticity, the Postal Service estimated heteroscedastic corrected standard errors.

Also, please note that the top-down model was not estimated using ordinary least squares (OLS). Rather, it was estimated using a sandwich or White/Huber estimator. It is well known that in the presence of heteroscedasticity, the OLS estimator is unbiased and consistent, but is not efficient and produces biased standard errors. An effective and widely-used method to deal with heteroscedasticity is to estimate robust standard errors that

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account for the heteroscedasticity. The sandwich or White estimator provides such robust standard errors by accounting for a non-constant error variance.

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- 14.** In its Response to CHIR No. 4, the Postal Service discusses the advantages of translog and quadratic functional forms for estimating street time variabilities. Response to CHIR No. 4, question 19. Please clarify whether, for the top-down equation, the Postal Service tested any functional forms other than the two referenced above.

**RESPONSE:**

It did not.

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15. In its Response to CHIR No. 4, the Postal Service states that “[e]xpanding the data sets to include additional months would cause the resource cost of constructing the SAS datasets to rise proportionally.” Response to CHIR No. 4, question 14. The Postal Service also identifies the different types of analytical and econometric activities required to estimate a top-down equation.
- a. For each activity listed in the table below, please estimate the time and cost required to perform it for a data set that includes data for one month and the current set of 300 ZIP Codes.
  - b. For each activity listed in the table below, please indicate whether the associated time and cost would increase proportionally to the number of additional months and ZIP Codes. If the anticipated increase is not proportional, please estimate the rate of increase.
  - c. Please provide specific estimates of time and resources costs that the Postal Service believes would be required to assemble and analyze data including the same variables as the July 2016 dataset provided in Library Reference USPS-PI2017-1/2 and covering:
    - i. the same 300 ZIP Codes sampled over a six-month period;
    - ii. the same 300 ZIP Codes sampled over a full calendar year;
    - iii. 600 ZIP Codes sampled over a six-month period; and
    - iv. 600 ZIP Codes sampled over a full calendar year.

Type of Analytical work	Time		Cost	
	Proportional or Not	Rate of Increase (if applicable)	Proportional or Not	Rate of Increase (if applicable)
Downloading data from operating data systems				
Combining the raw data into usable input data set				
Analysis of data for anomalies or data errors				
Estimating the Top-Down Equation				
Investigating multiple econometric issues				
Other (please specify)				

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**RESPONSE:**

a. The tasks listed in the table are not separable. They were provided in the previous response as examples of the types of work required, and were not intended to be interpreted as separate tasks. In other words, they are done in conjunction with one another, and it is not practicable to provide separate time or cost estimates for each one. The time required to produce the data, review the data, construct an analysis data set, estimate the top-down model, investigate relevant econometric issues, and produce the report for the top-down model submitted in this case was approximately four and one-half months.

b. The first three, data-related tasks are likely to be proportional to the amount of data collected because the amount of time to download, combine, and evaluate an observation is roughly constant. Estimating the top-down equation would likely be less than proportional, although it is difficult to be definitive. As stated in the response to question 14 in CHIR No. 4:

Estimating the regression should not grow proportionately. However, as the time dimension of the data set grows, time related issues like seasonality and autocorrelation arise, increasing the time required for estimating the regression.

Obviously the computer time required to actually estimate the regression would not be expected to grow proportionally, but econometric issues arising from a larger data set could grow more than proportionally. For example, going from one month's worth of data to one year's worth of data could cause the researcher



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to have to account for a seasonal pattern in the data and the possibility of serial correlation across months. Because these were not issues with one month of data, the estimation time would increase. Whether or not it would be proportional to the increase in data is difficult to determine without knowing the specific characteristics of the data involved. A similar situation occurs for investigating multiple econometric issues. A large data set could bring forth additional econometric issues not associated with a smaller data set and the possibility of an increased number of alternative methods for dealing with these issues. Again, it is difficult to assess the rate of increase in time for such a possibility in general terms.

Type of Analytical work	Time		Cost	
	Proportional or Not	Rate of Increase (if applicable)	Proportional or Not	Rate of Increase (if applicable)
Downloading data from operating data systems	Yes		Yes	
Combining the raw data into usable input data set	Yes		Yes	
Analysis of data for anomalies or data errors	Yes		Yes	
Estimating the Top-Down Equation	Probably Not	Difficult to say	Probably Not	Difficult to say
Investigating multiple econometric issues	Probably Not	Difficult to say	Probably Not	Difficult to say
Other (please specify)	Unknown	Unknown	Unknown	Unknown

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c.i. As noted in the response to part b, the time required to assemble and analyze the data is roughly proportional to the amount of data collected and processed. Thus, the time required to assemble and analyze six months of data for 300 ZIP Codes would be approximately six times as long as for one month. As the only resource cost for the data assembly and analysis would be the salaries and benefits for Postal Service employees and contractors, the costs would also likely rise six times as much.

c.ii. As noted in the response to part b, the time required to assemble and analyze the data is roughly proportional to the amount of data collected and processed. Thus, the time required to assemble and analyze twelve months of data for 300 ZIP Codes would be approximately twelve times as long as for one month. As the only resource cost for the data assembly and analysis would be the salaries and benefits for Postal Service employees and contractors, the costs would also likely rise twelve times as much.

c.iii. As noted in the response to part b, the time required to assemble and analyze the data is roughly proportional to the amount of data collected and processed. Thus, the time required to assemble and analyze six months of data for 600 ZIP Codes would be approximately twelve times as long as for one month for 300 ZIP Codes. As the only resource cost for the data assembly and analysis would be the salaries and benefits for Postal Service employees and contractors, the costs would also likely rise twelve times as much.

c.iv. As noted in the response to part b, the time required to assemble and analyze the data is roughly proportional to the amount of data collected and processed. Thus, the

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time required to assemble and analyze twelve months of data for 600 ZIP Codes would be approximately twenty-four times as long as for one month for 300 ZIP Codes. As the only resource cost for the data assembly and analysis would be the salaries and benefits for Postal Service employees and contractors, the costs would also likely rise twenty-four times as much.